

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Patent Application Under 37 C.F.R. §1.53 (b)

for

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TRACK FITTING FOR A CARGO SECURITY SYSTEM

CROSS REFERENCES TO RELATED APPLICATIONS

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This application claims priority to U.S. Provisional Application Serial No. 60/454,228 filed March 13, 2003, the entire disclosure of which is incorporated herein by this reference.

FIELD OF THE INVENTION

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The present invention relates to the field of cargo restraint apparatus for airplanes and other vehicles, and, more particularly, to a track fitting for a cargo security system, which is designed to prevent, detect, and deter the theft and the unauthorized introduction of foreign materials into a cargo load.

BACKGROUND OF THE INVENTION

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When cargo is being transported, for example, by commercial aircraft, it must be arranged on a pallet, such as a Unit Load Device (ULD), before being loaded into the cargo section of the aircraft. If desired, the cargo may be covered with weatherproof material, such as a layer of plastic, to provide protection from external elements. Thereafter, a net is placed over

the cargo and secured to the pallet with anchoring devices, thereby securing the cargo to the pallet. Typically, the cargo net is secured to the pallet in the following manner. The pallet is provided with a track running along its perimeter, a so-called "pallet-track." The cargo net is equipped with permanently attached anchoring devices, known as cargo track fittings, spaced at
5 predetermined intervals about the perimeter of the net. Each track fitting has a base designed to mate with openings formed in the pallet-track allowing it to be secured to the track.

The net primarily serves to protect the interior of the aircraft from damage caused by the shifting of the cargo during transport. In this regard, the net is capable of securing the cargo such that it does not fall from the pallet or become lost during shipment; however, the net does little to
10 protect against the introduction of foreign material, such as explosives or contraband, into the cargo or the removal and theft of items from the cargo. Indeed, by design, the net has a plurality of holes through which material may be introduced or removed. Additionally, gaps remain between the top of the pallet and the base of the net between points where the track fittings secure the net to the pallet. Furthermore, the track fittings are easily disengaged from the pallet-
15 track, allowing introduction of foreign material or removal of larger items. In this manner, potentially dangerous foreign materials and other contraband can be introduced into and/or valuable cargo may be removed without detection.

Accordingly, there is a need in the art for a method and device that satisfactorily addresses the problems associated with known cargo restraint systems as set forth above.

SUMMARY OF THE INVENTION

The present invention addresses the above identified problems, and others, by providing a system for securing cargo during transport that prevents, detects and deters both the theft of cargo and the unauthorized introduction of foreign materials into the cargo load.

5 The present invention is a track fitting for a cargo security system. The track fitting may be used to anchor a variety of items to a track; for example, the track fitting may be used as part of a complete cargo security system, which includes a cargo covering. An exemplary embodiment of the track fitting includes a body and a plunger that is placed over a front portion of the body. The body also includes a substantially C-shaped rear portion, which is supported by
10 two integral feet and defines an opening between the feet, the importance of which will be discussed below.

 The exemplary track fitting is designed to be anchored to a track, for example, a track extending around the perimeter of a traditional pallet used in the cargo handling industry. The track defines a channel with a series of enlarged openings spaced at predetermined intervals
15 along its length. Each foot of the rear portion of the body of the fitting fits into each of the enlarged openings defined by the track. Additionally, a lower end of the plunger fits into each of the enlarged openings defined by the track. To secure the exemplary track fitting to the track, the plunger is pulled upward, into a first position, and the track fitting is placed on the track by lowering the feet into adjacent enlarged openings. The track fitting is then slid within the
20 channel defined by the track until the lower end of the plunger is aligned with a desired enlarged opening. The plunger is then released into a second position, allowing the lower end of the plunger to drop into the desired enlarged opening, thereby securing the track fitting to the track.

A plurality of exemplary track fittings may be used as part of a complete cargo security system, which includes a cargo covering and the plurality of track fittings for securing the covering to a track. In the exemplary embodiment, the substantially C-shaped rear portion of each track fitting is hooked to a catch on the covering and the track fitting is brought down and secured to the track. A sufficient number of fittings are used to secure the covering to the track such that no gap exists between the covering and the upper surface of the track. Each secured track fitting may be locked to the track by temporarily disabling the movement of the plunger. For example, each exemplary track fitting may include an upwardly extending projection, which extends through the top of the plunger and defines an aperture. A locking cable may be fed through the apertures in the projections of each track fitting secured to the track, blocking the upward sliding movement of each plunger. The ends of the cable may then be locked to one another, thereby locking the covering to the track such that foreign material cannot be introduced, nor can cargo be removed without tampering with the system. The ends of the locking cable may be secured with a fastening apparatus, such as a cable tie, which may thereafter be covered with a tag or label carrying a tracking code. In this regard, the locking cable cannot be removed without cutting the fastening apparatus and destroying the tracking label, thereby signaling that the cargo has been tampered with.

Additionally, the exemplary covering may have an inside surface and an outside surface, wherein the two surfaces are contrasting colors. If the covering was cut, for example, to effect introduction of material into or removal of material from the cargo, the contrasting color on the inside surface of the covering would become clearly visible, thereby signaling that the cargo had been tampered with. Alternatively, a thread-like material, that frays when cut, could be woven

into the surface of the covering. If the covering was cut, the frayed material would provides a signal that the cargo had been tampered with.

The system and track fitting may also be used concurrently with a traditional cargo net. For example, the cargo net could be placed over the covering and the track fitting could be used to secure both the covering and the cargo net to a track. The exemplary track fitting could also be used to secure a traditional cargo net to a track, for example, it could be used in place of a traditional cargo-net-repair kit.

10 DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of an exemplary embodiment of a track fitting of the present invention, illustrating the plunger in the second position;

Figure 1A is a side view of the track fitting of Figure 1, again illustrating the plunger in the second position;

Figure 2 is an alternate perspective view of the track fitting of Figure 1, illustrating the plunger in the first position;

Figure 2A is a side view of the track fitting of Figure 1, again illustrating the plunger in the first position;

Figure 3 is a perspective view of the track fitting of Figure 1, positioned on a track;

Figure 3A is a cross sectional view of the track fitting taken along line 3A-3A of Figure 3;

Figure 4 is a perspective view of two exemplary track fittings of the present invention, positioned on a track and securing a covering;

Figure 5 is an enlarged perspective view of one of the exemplary track fittings of Figure 4; and

Figure 6 is another enlarged perspective view of one of the exemplary track fittings of Figure 4.

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DETAILED DESCRIPTION OF THE INVENTION

The present invention is a track fitting for a cargo security system for securing cargo during transport, the system being designed to prevent, detect and deter both the theft of cargo and the unauthorized introduction of foreign materials into the cargo load.

10 An exemplary embodiment of the track fitting 10 of the present invention will first be discussed with reference to Figures 1, 1A, 2 and 2A. The track fitting 10 includes a body 12 and a plunger 14. The body 12 has a substantially C-shaped rear portion 16, supported by an integral first foot 18 and an integral second foot 20, and a front portion 22 over which the plunger 14 is placed. The C-shaped rear portion 16 of the body 12 defines an opening 24 between the feet 18, 20, the importance of which will be discussed further below.

15 Referring now to Figures 3 and 3A, the exemplary track fitting 10 is designed to be anchored to a track 30, for example, a track extending around the perimeter of a traditional pallet used in the cargo handling industry. However, it is contemplated that the track could be a track secured to the bed of a pick-up truck, or a track mounted to any other desired object, without departing from the spirit and scope of the present invention. The track 30 defines a channel 32 with a series of enlarged openings 34 spaced at predetermined intervals along its length. The feet 18, 20 of the C-shaped rear portion 16 of the body 12 of the track fitting 10 are each adapted

to be received by each of these enlarged openings 34. Additionally, a lower end 36 of the plunger 14 is adapted to be received by each of these enlarged openings 34.

To secure the exemplary track fitting 10 to the track 30, the plunger 14 is pulled into a first position, shown in Figures 2 and 2A. Although it is not necessary, in certain embodiments, the plunger 14 is slidably secured to the front portion 22 of the body 12 and biased toward a second position, shown in Figures 1 and 1A, using, for example, a spring. With reference again to Figures 3 and 3A, the track fitting 10, with the plunger 14 in the first position, is placed on the track 30 by lowering the feet 18, 20 into adjacent enlarged openings 34. The track fitting 10 is then slid within the channel 32 defined by the track 30 until the lower end 36 of the plunger 14 is aligned with a desired enlarged opening 34. The plunger 14 is then released into the second position, allowing the lower end 36 of the plunger 14 to drop into the desired enlarged opening 34, thereby preventing the horizontal sliding of the fitting 10 within the track 30. When the lower end 36 of the plunger 14 is aligned with the desired enlarged opening 34, the feet 18, 20 are not aligned with any enlarged opening 34, thus, the feet 18, 20 prevent the vertical movement of the fitting 10 from the track 30. In this manner, the track fitting 10 is secured to the track 30.

Turning now to Figure 4, a plurality of exemplary track fittings 10 may be used as part of a complete cargo security system 100, which additionally includes a cargo covering 11, the track fittings 10 being used to secure the covering 11 to a discrete section of track 30 positioned along the periphery of a pallet or similar support. In the exemplary embodiment, the substantially C-shaped rear portion 16 of the body 12 of each track fitting 10 is hooked to a catch or eye 48 on the covering 11. For example, the covering 11 may include a plurality of permanently attached O-shaped rings, each of which act as the catch 48. The rear portion 16 of the base 12 of each track fitting 10 may receive one of these catches 48 before the fitting 10 is brought down and

secured to the track 30. While the fitting 10 is secured to the track 30, the opening 24 defined by the rear portion 16 of the body 12 is blocked by the track 30 such that the catch 48 cannot be unhooked from the fitting 10. Additionally, it is contemplated that the covering 11 include several rows of catches 48 (e.g., attached rings) allowing the covering 11 to be adjusted to fit tightly over cargo loads of various sizes. It should be noted that the catches 48 of the depicted covering 11 are but one example of a contemplated catch capable of being accepted by and hooked to an exemplary fitting, and other catches of various shapes and sizes could certainly be employed without departing from the spirit and scope of the present invention.

Referring still to Figure 4, a sufficient number of fittings 10 are used to secure the covering 11 to the track 30 such that no significant gap exists between the covering 11 and the upper surface of the track 30. After the track fittings 10 have been secured to the track 30, each can be locked thereto by temporarily disabling the movement of the plunger 14. As best shown in Figures 1, 1A, 2 and 2A, the body 12 of the exemplary track fitting 10 further includes an upwardly extending projection 38, which extends through the top of the plunger 14 and has an aperture 40 defined therethrough. As shown in Figure 3, the aperture 40 is adapted for receiving a locking cable 42, and, as shown in Figure 4, the locking cable 42 can be fed through the apertures 40 in the projections 38 of each of a plurality of track fittings 10 secured to the track 30, blocking the upward sliding movement of each plunger 14. The ends of the cable 42 may then be locked to one another, thereby locking the covering 11 to the track 30 such that foreign material cannot be introduced into the cargo, nor can cargo be removed, without tampering with the system 100.

For example, as shown in Figure 6, the ends 42a, 42b of the locking cable 42 could be secured with a fastening apparatus 44, such as a cable tie, which may thereafter be covered with

a tag or label 46 carrying a tracking code such that the locking cable 42 cannot be removed without cutting the fastening apparatus 44 and destroying the tracking label 46. Thus, if the fastening apparatus 44 has been tampered with, such tampering can be easily detected because, even if the same or similar fastening apparatus is used to reattach the ends 42a, 42b of the locking cable 42, the tracking label cannot be reproduced. Of course, this is but one example of a manner in which a plurality of track fittings 10 may be locked to the track 30, and other methods could be used without departing from the spirit and scope of the present invention. For example, each track fitting could be provided with an individual fastening apparatus allowing each track fitting to be locked to the track individually.

Referring back to Figure 4, it is contemplated that an exemplary covering 11 may have an inside surface (not shown) and an outside surface 50, wherein the two surfaces are contrasting colors. For example, the inside surface (not shown) could be red, and the outside surface 50 could be white. If the covering 11 was cut, for example, to effect introduction of material into or removal of material from the cargo, the contrasting color on the inside surface (not shown) of the covering 11 would become clearly visible, thereby signaling that the cargo had been tampered with. Alternatively, a thread-like material, that frays when cut, could be woven into the surface of the covering 11. If the covering 11 was cut, for example, to effect introduction of material into or removal of material from the cargo, the frayed material would provides a signal that the cargo had been tampered with.

In any event, the covering 11 in this example is made of water-resistant, durable, lightweight, fiberglass-woven material to provide durability and protection from damage to the cargo and to eliminate the need to pre-wrap the cargo with weather-proof material. However, the covering 11 may be made from a variety of durable and substantially flexible materials, for

example, nylon, PP webbing, natural or synthetic cloth, or leather, without departing from the spirit and scope of the present invention.

Additionally, with reference to Figure 5, the system 100 and track fitting 10 of the present invention may be used concurrently with a traditional cargo net 52. In this regard, it is contemplated that the track fitting 10 of the present invention could be used as an alternative to a traditional cargo-net-repair kit. As mentioned above, a cargo net is typically equipped with permanently attached track fittings spaced at predetermined intervals about the perimeter of the net. If the net is damaged, allowing one or more of these attached track fittings to become detached, a traditional cargo-net-repair kit is used in place of each detached fitting to secure the damaged net to the track of a pallet. A traditional cargo-net-repair kit comprises a traditional track fitting having a body defining an aperture through which an adjustable strap is threaded. The strap includes hooks allowing it to be attached to two parts of the damaged net, thereby securing the net to the traditional track fitting and allowing it to be secured to the track of the pallet. Because the rear portion 16 of the body 12 of the track fitting 10 of the present invention defines an opening 24, forming a hook, the track fitting 10 of the present invention can be hooked to a damaged net and secured to the pallet making it an ideal alternative to a traditional cargo-net-repair kit.

Finally, it is contemplated that the track fitting 10 of the present invention be compatible not only with the tracks 30 of pallets currently being used in the cargo handling industry, but also with tracks having alternative designs. For example, tracks could be mounted to the bed of a truck, and the fitting of the present invention could be used to secure a covering to the track, thereby securing and protecting cargo being transported in the truck.

It will be obvious to those skilled in the art that other modifications may be made to the invention described herein without departing from the spirit and scope of the present invention.